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US 4318882 A

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(54) Abstract Title
Dispensing container suitable for children and adults

(57) A container 6, designed to be easily used by children and the elderly, comprises a body 22 with recesses 15, 16 on front and rear sides 13, 14 defining first and second panels 17, 18, and a neck 3 defining an opening 1. The container may be made of a mixture of different density polyethylenes, and may be used as a dispenser for liquids, solids such as talcum powder (fig 8), foams, or aerosols (fig 7). The container may have a closure with a flat suface that allows the container to be stored in an inverted position (fig 14), or alternatively, the container may be kept inverted by a pair of supports (71, 72, fig 13) that cooperate with the recesses of the body. The closure may be in the form of a press-fit, snap-on, snap and turn, or an oriented thread lid, and the container may also be provided with finger grips (25, 26, fig 3A). A valve (80, fig 15A) may also be provided that has a threshold pressure below which the contents of the container will not be dispensed, but which can be easily activated by children or the elderly.

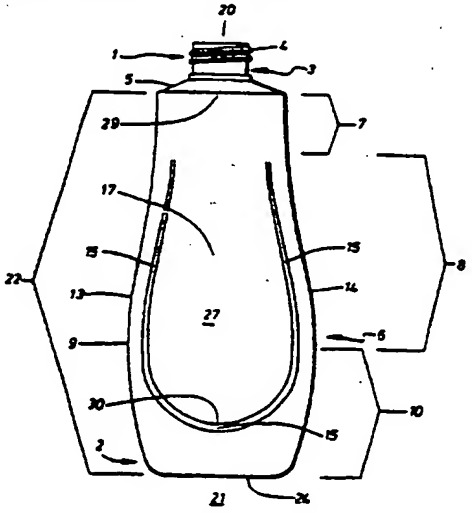

FIG. 1A

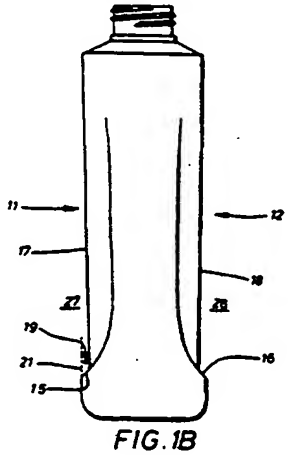

FIG. 1B

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

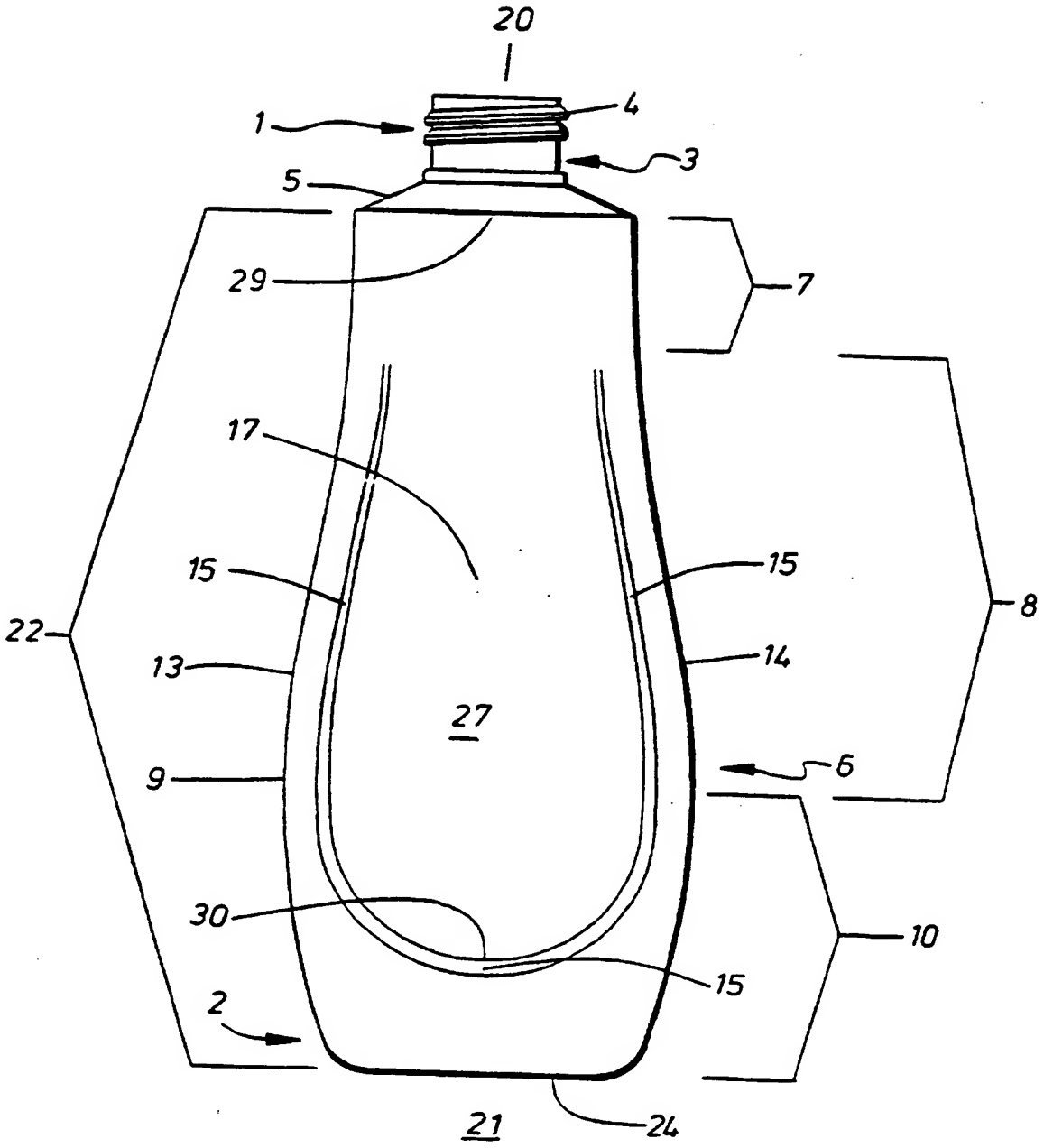


FIG. 1A

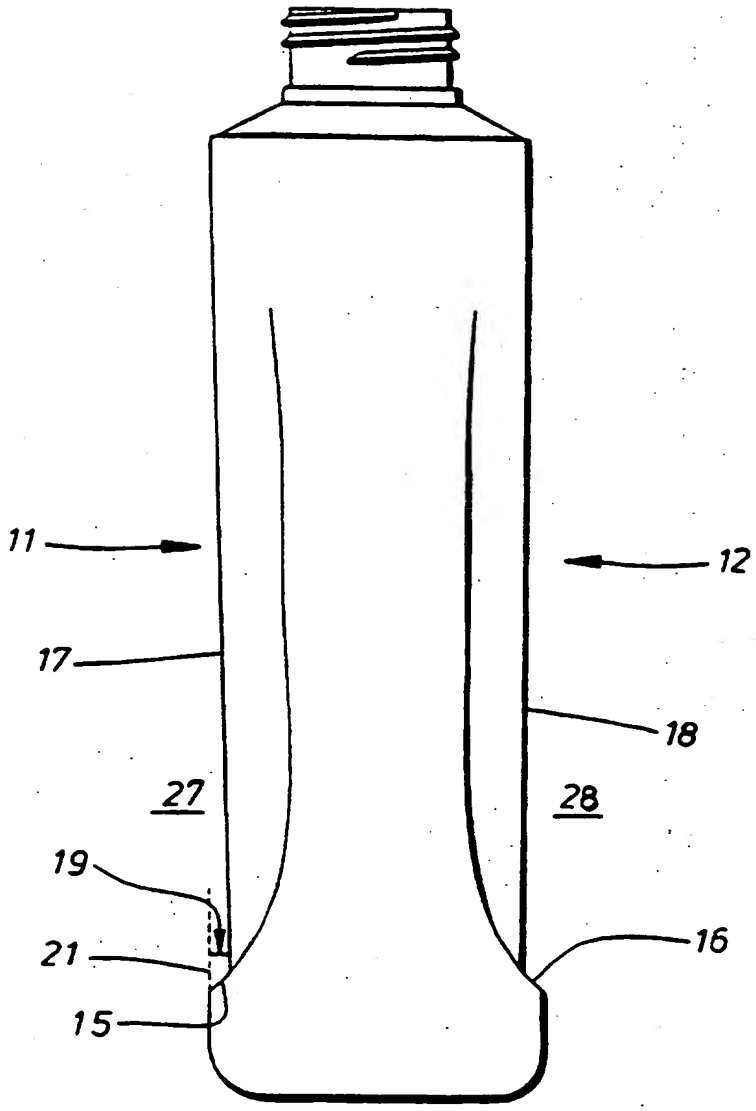


FIG. 1B

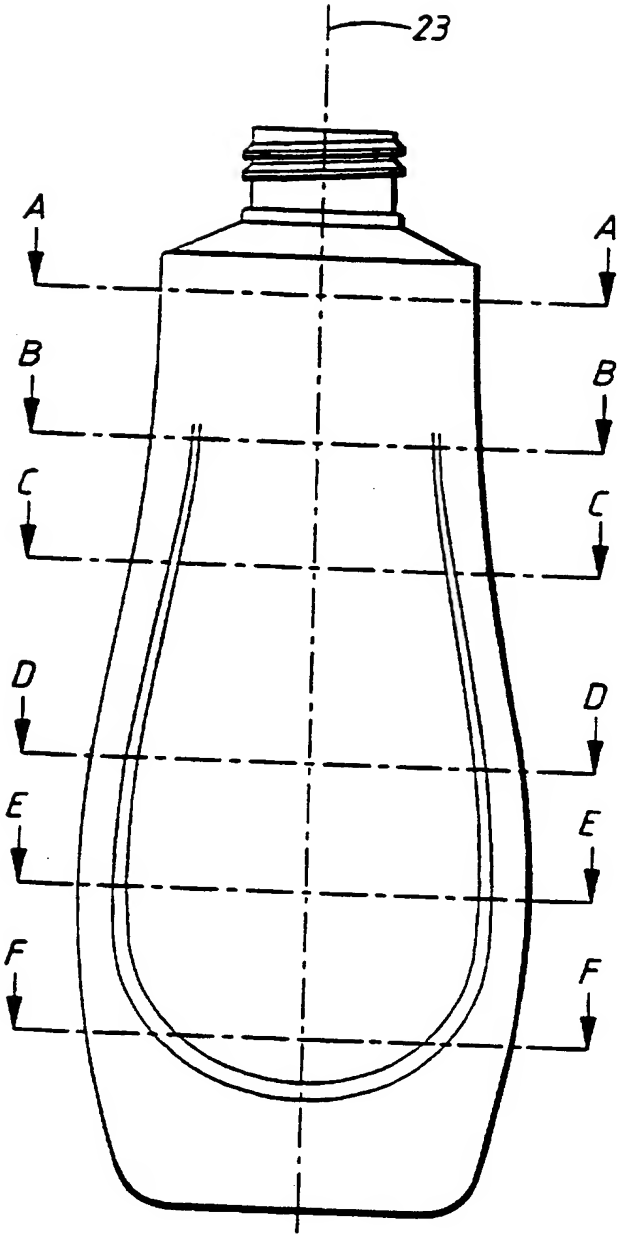


FIG. 1C

FIG. 2A

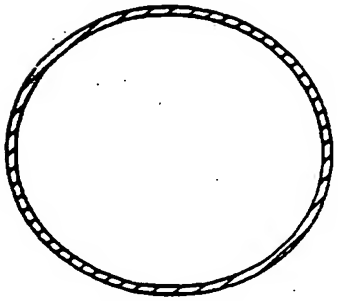


FIG. 2D

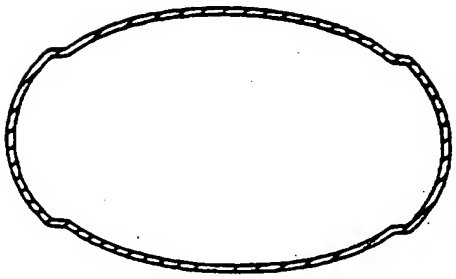


FIG. 2B

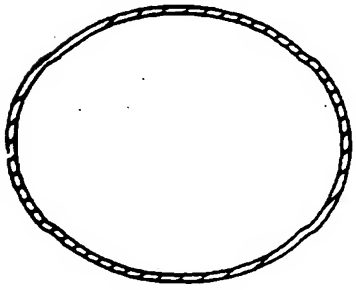


FIG. 2E

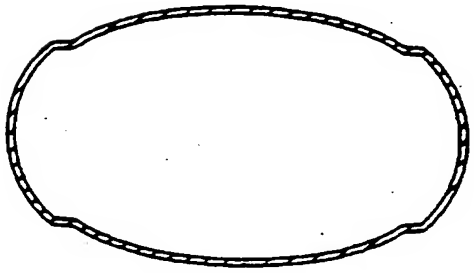


FIG. 2C

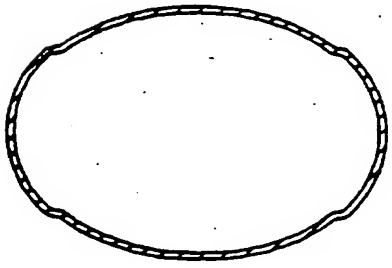


FIG. 2F

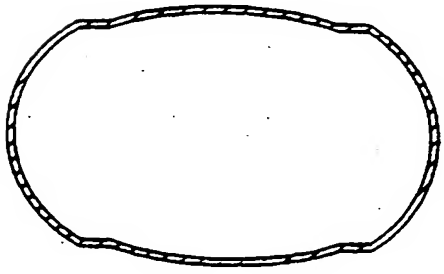
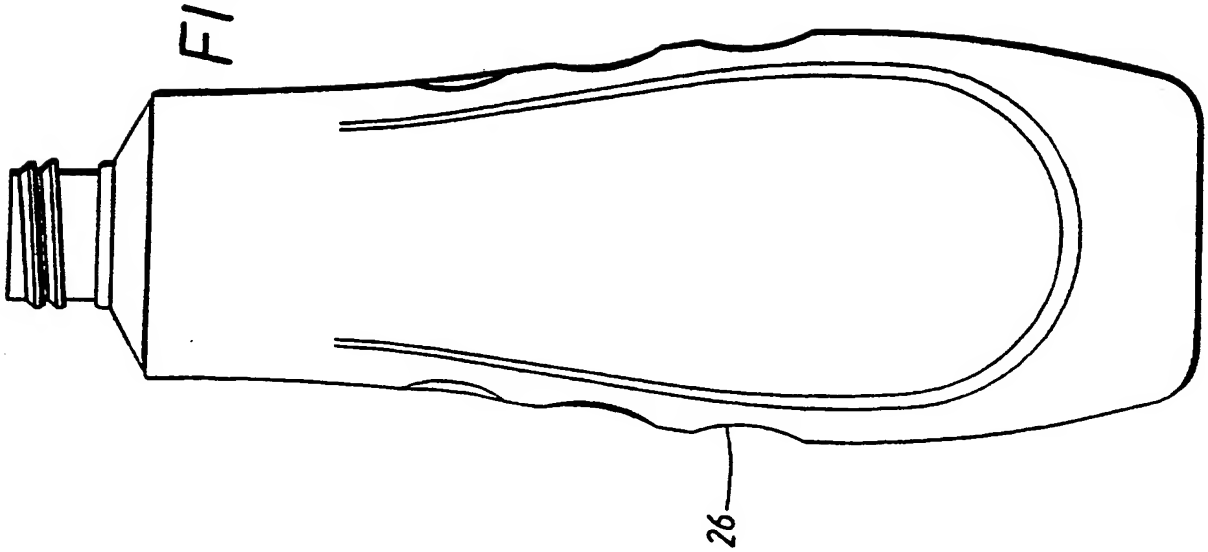


FIG. 3B



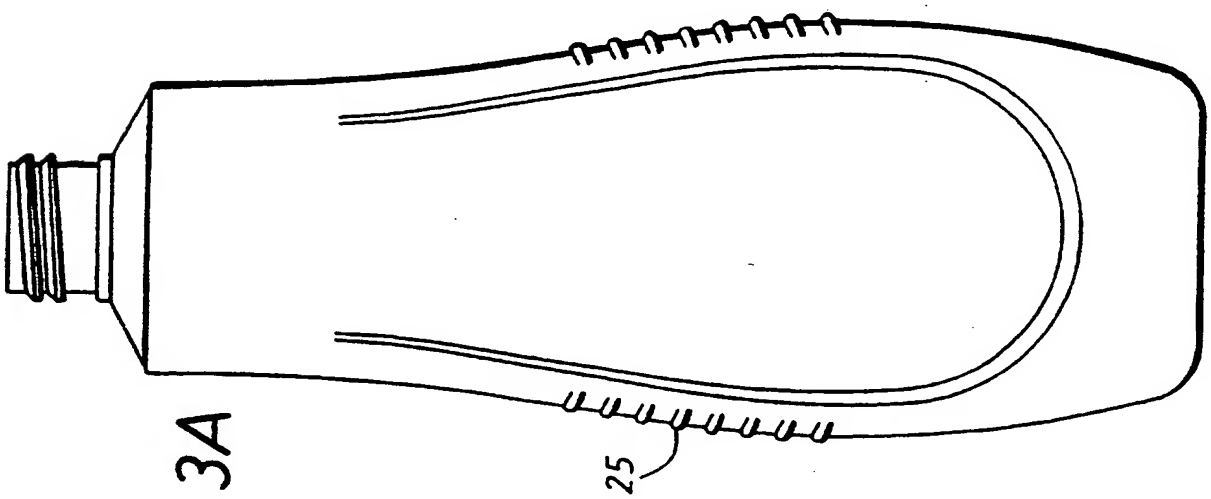
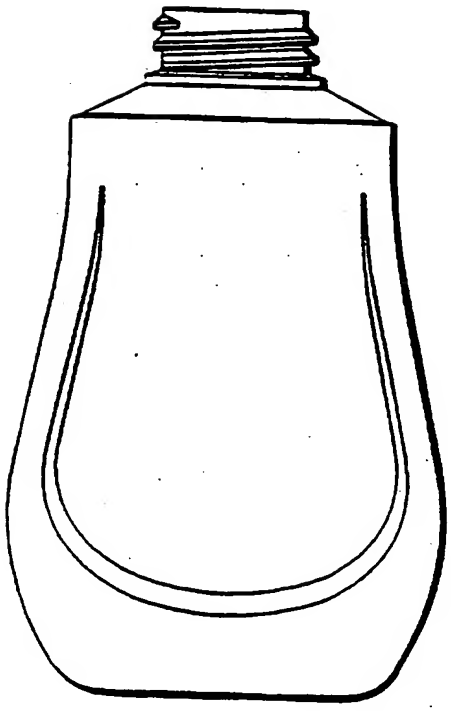


FIG. 3A

FIG. 4



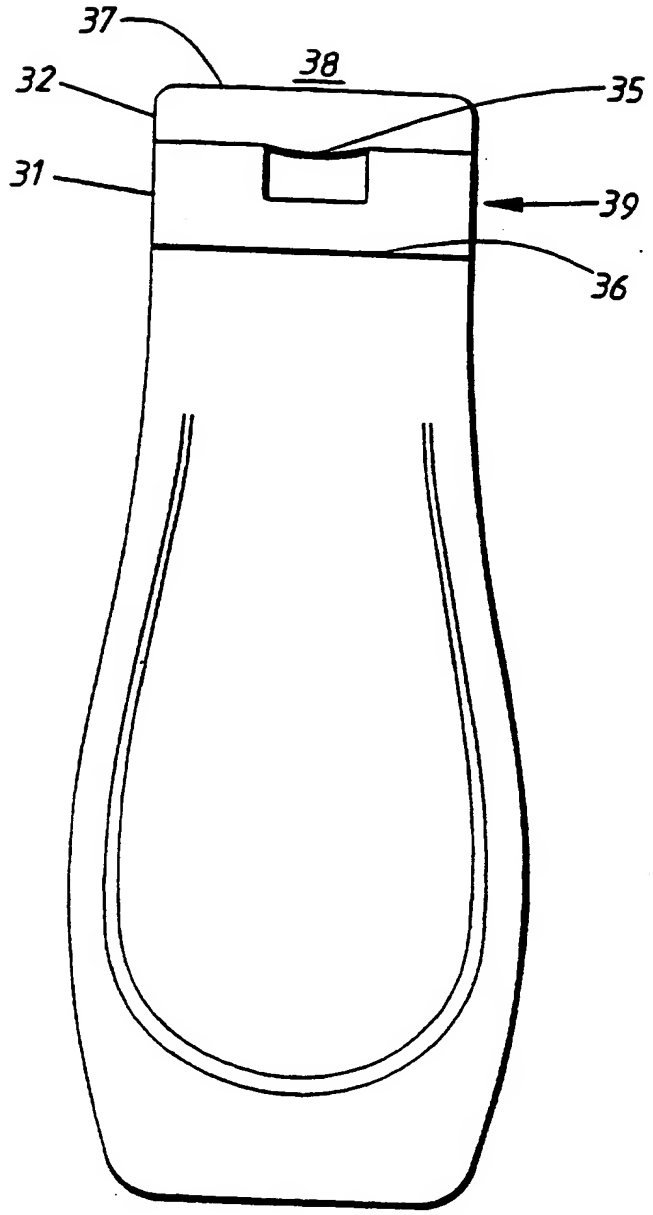


FIG. 5A

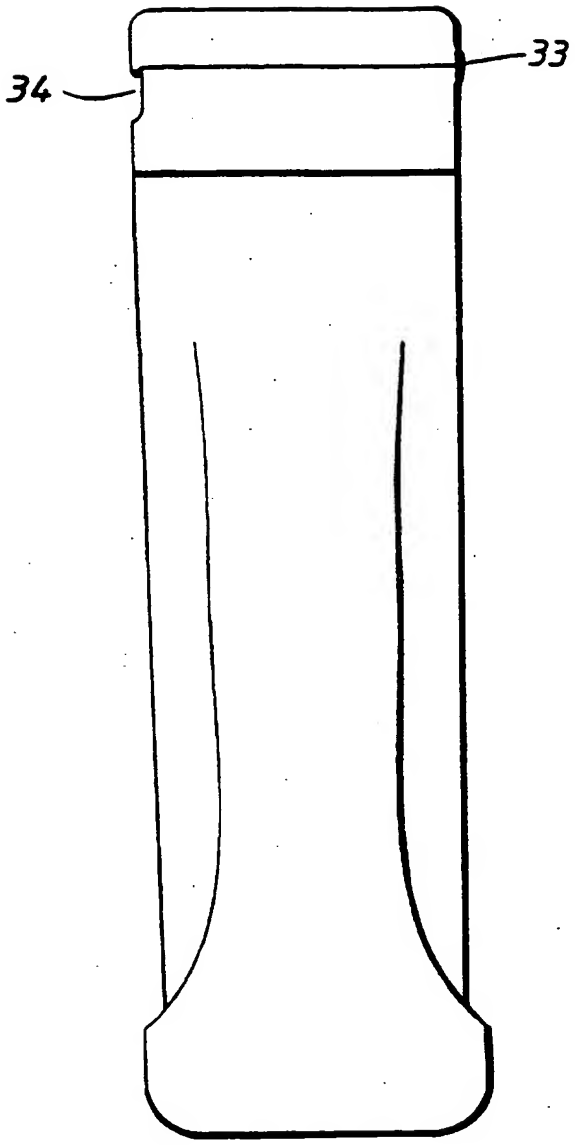


FIG. 5B

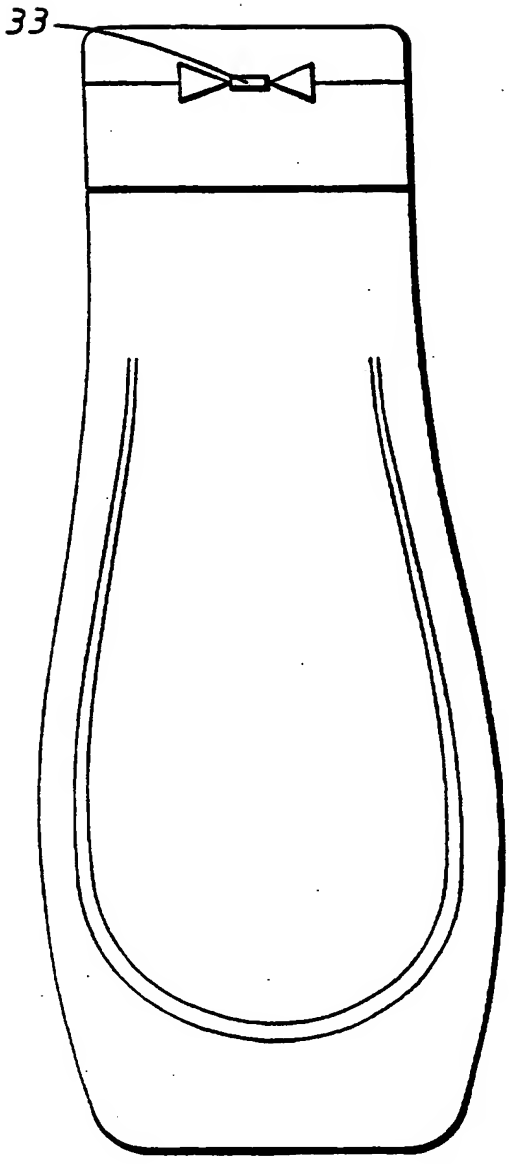


FIG. 5C

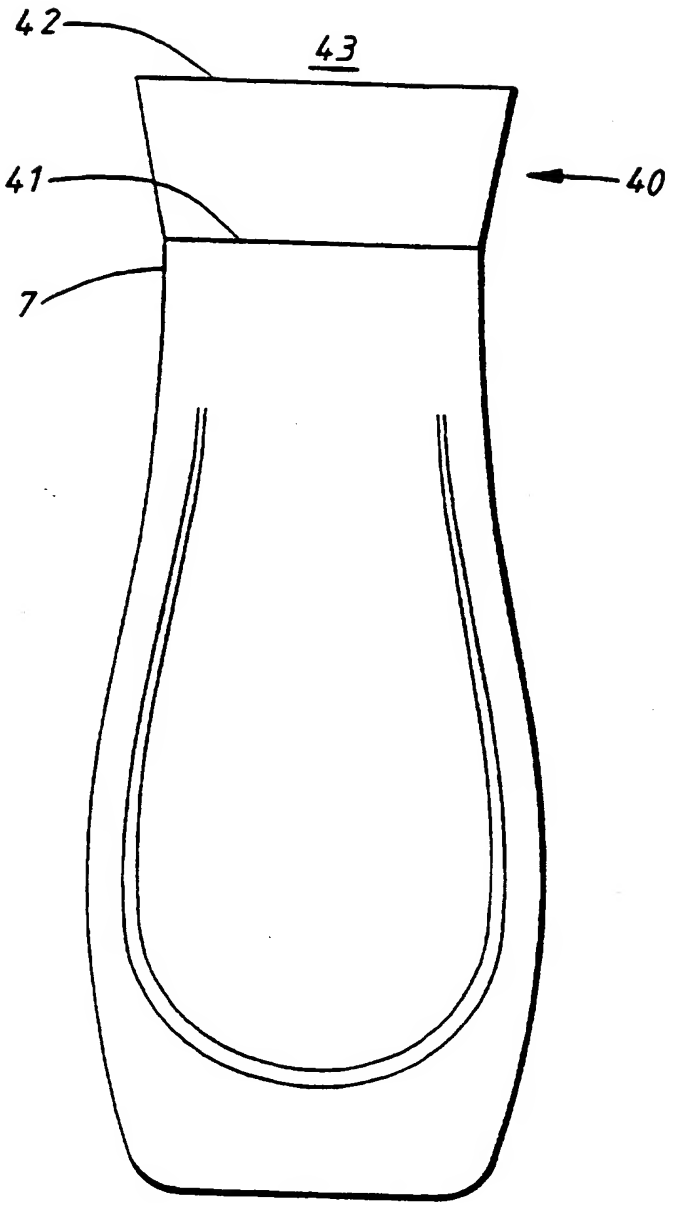


FIG. 6A

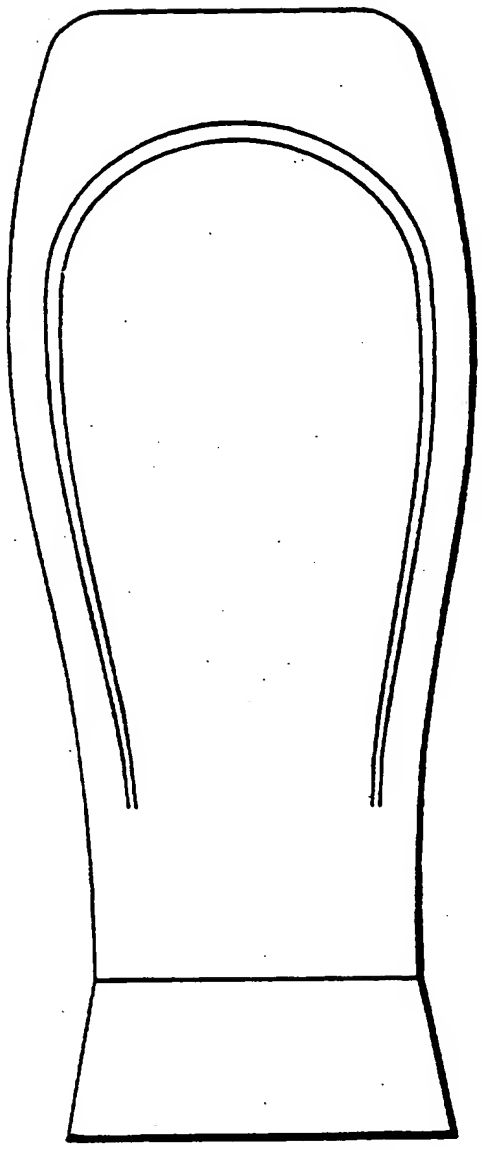


FIG. 6B

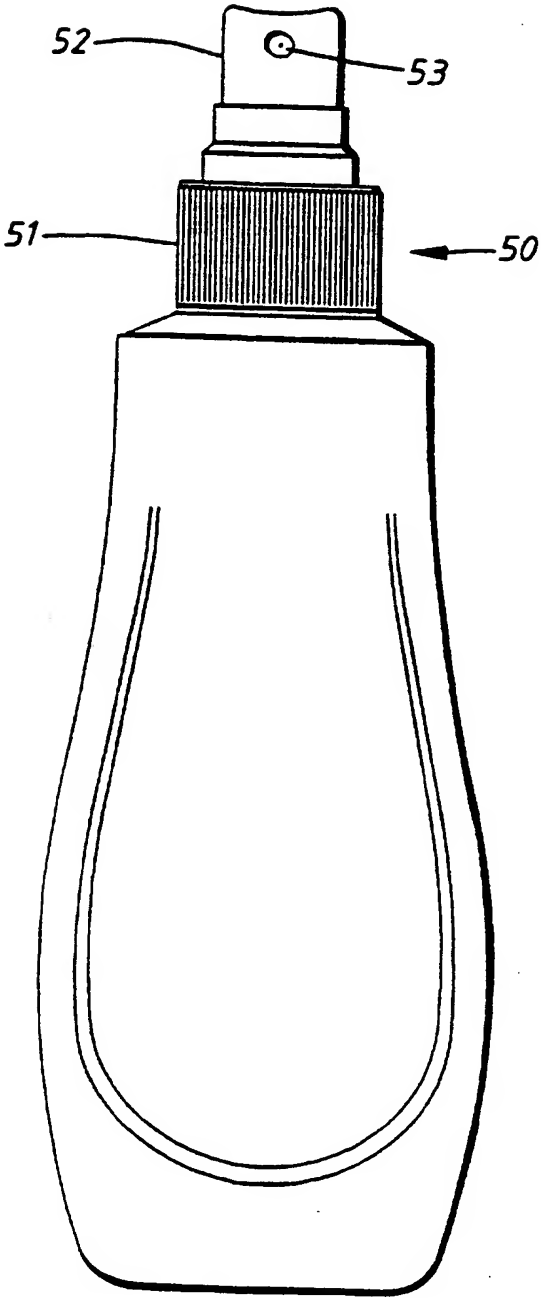


FIG. 7

FIG. 9

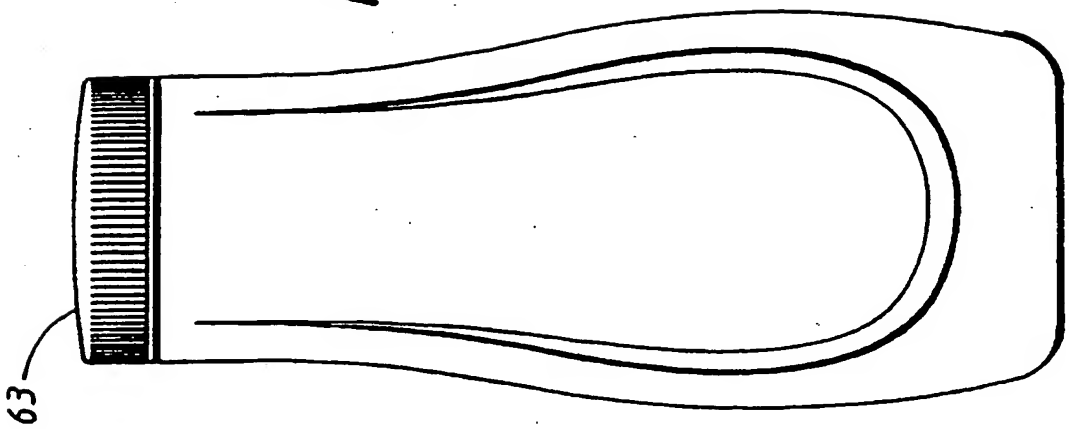
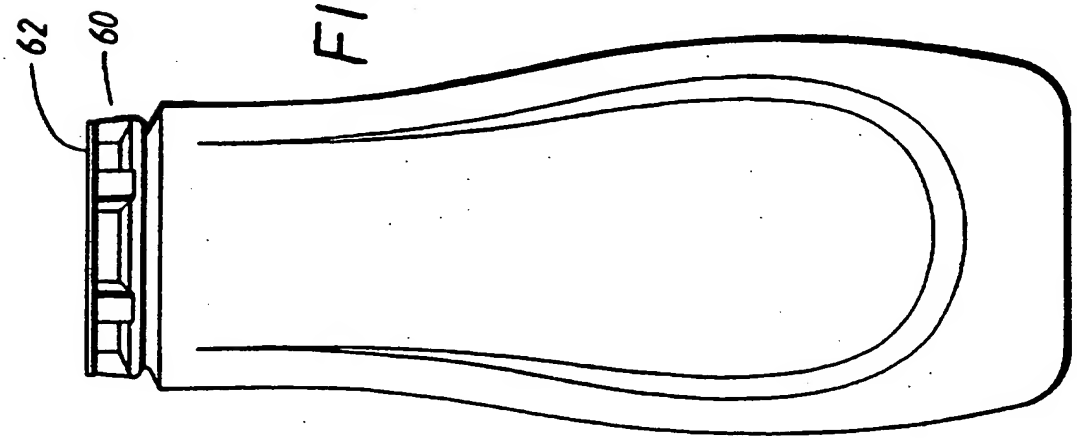


FIG. 8



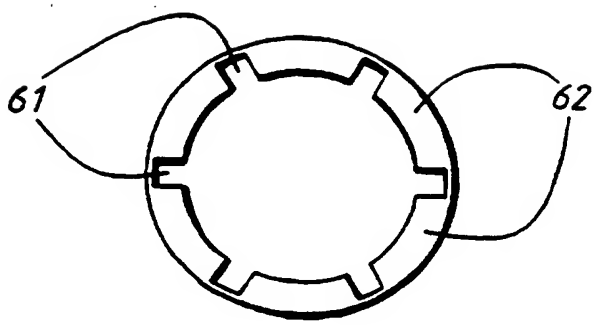


FIG. 10A

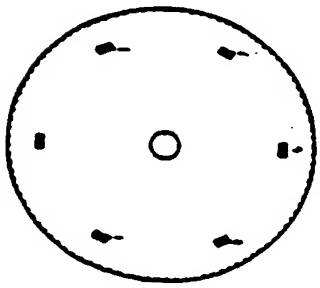


FIG. 10B

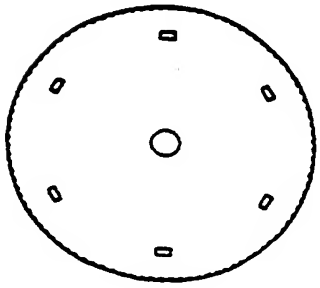
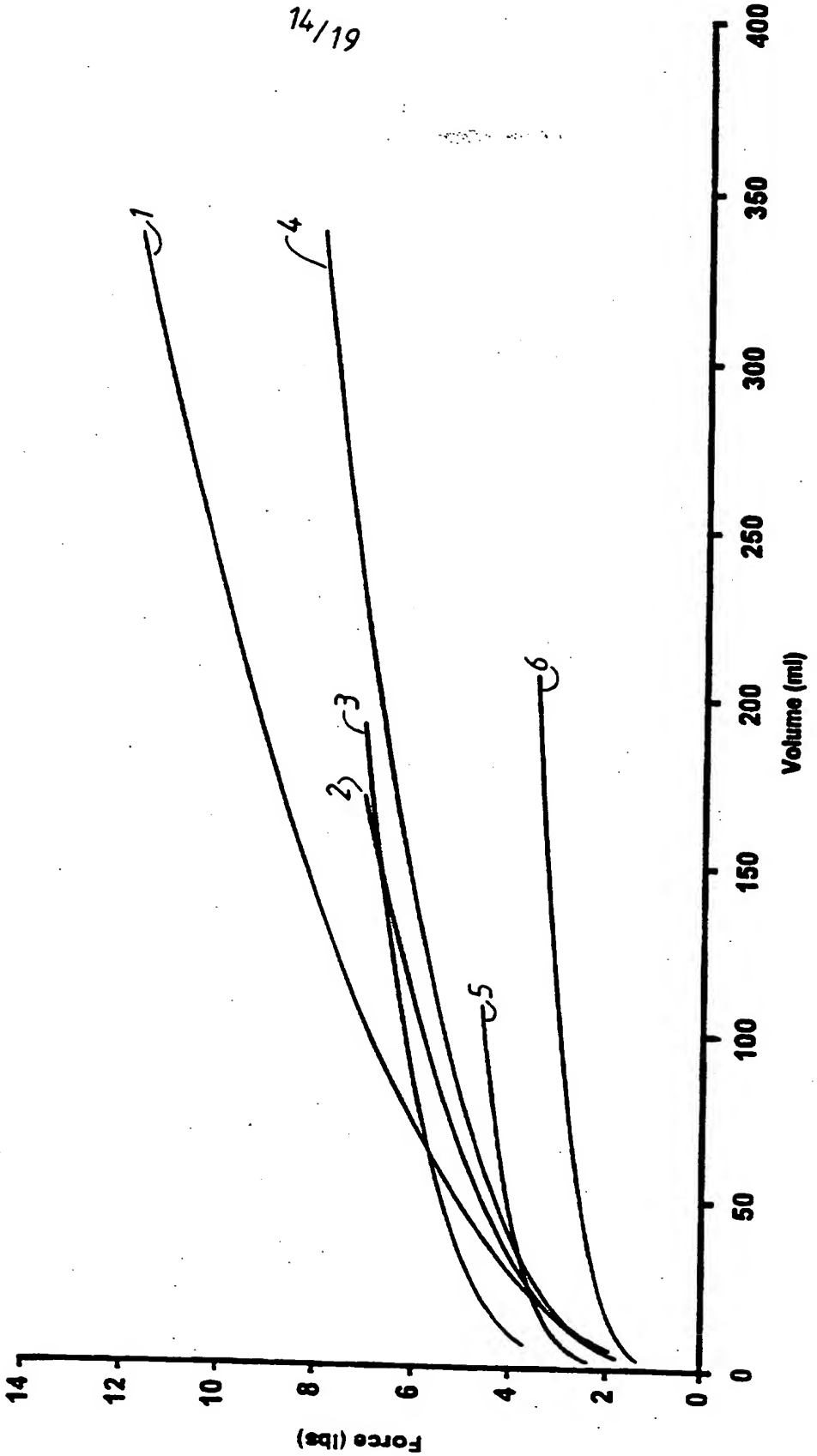


FIG. 10C

FIG. 11


Force (lbs)
0
2
4
6
8
10
12
14
Volume (ml)
0
50
100
150
200
250
300
350
400
1
2
3
4
5
6

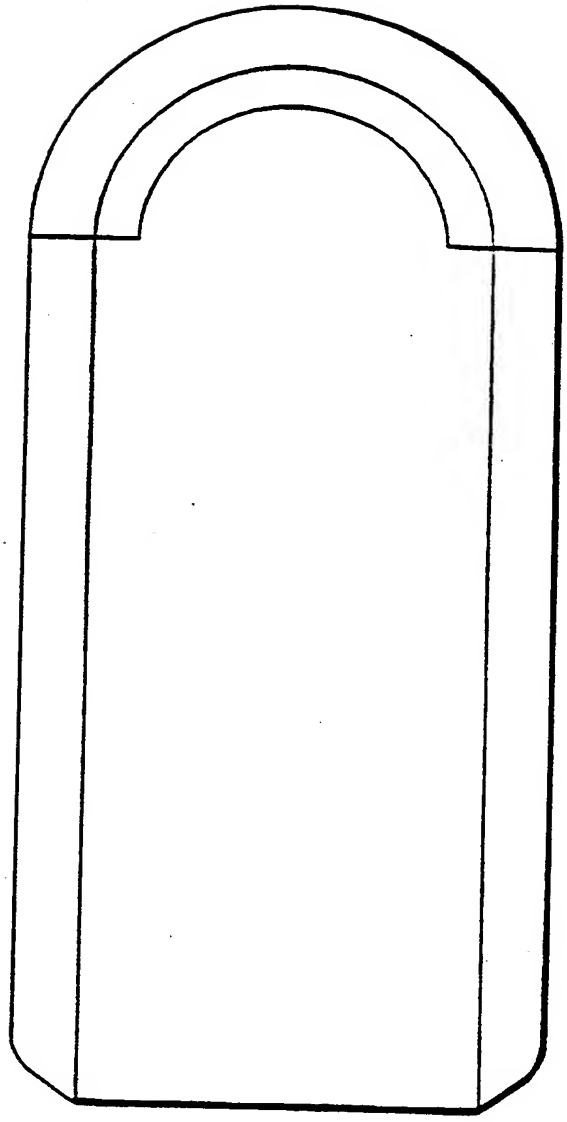


FIG. 12A

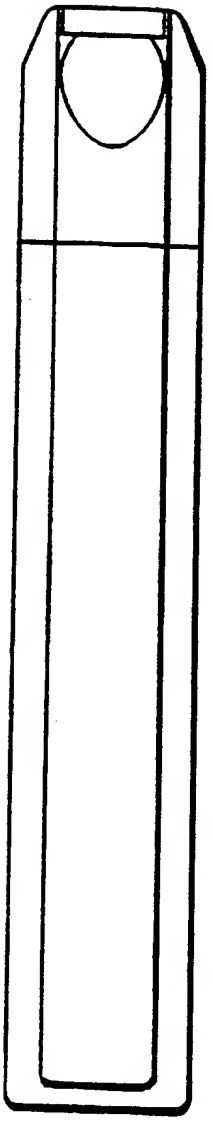


FIG. 12B

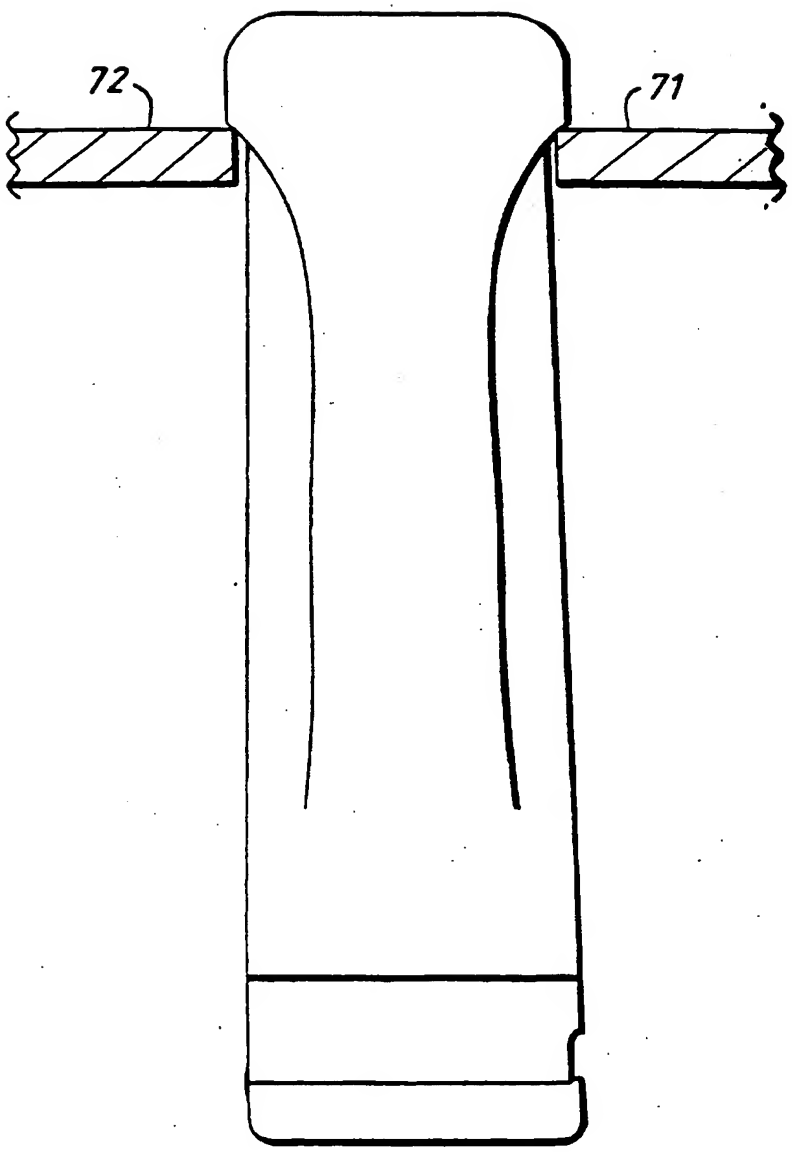


FIG. 13

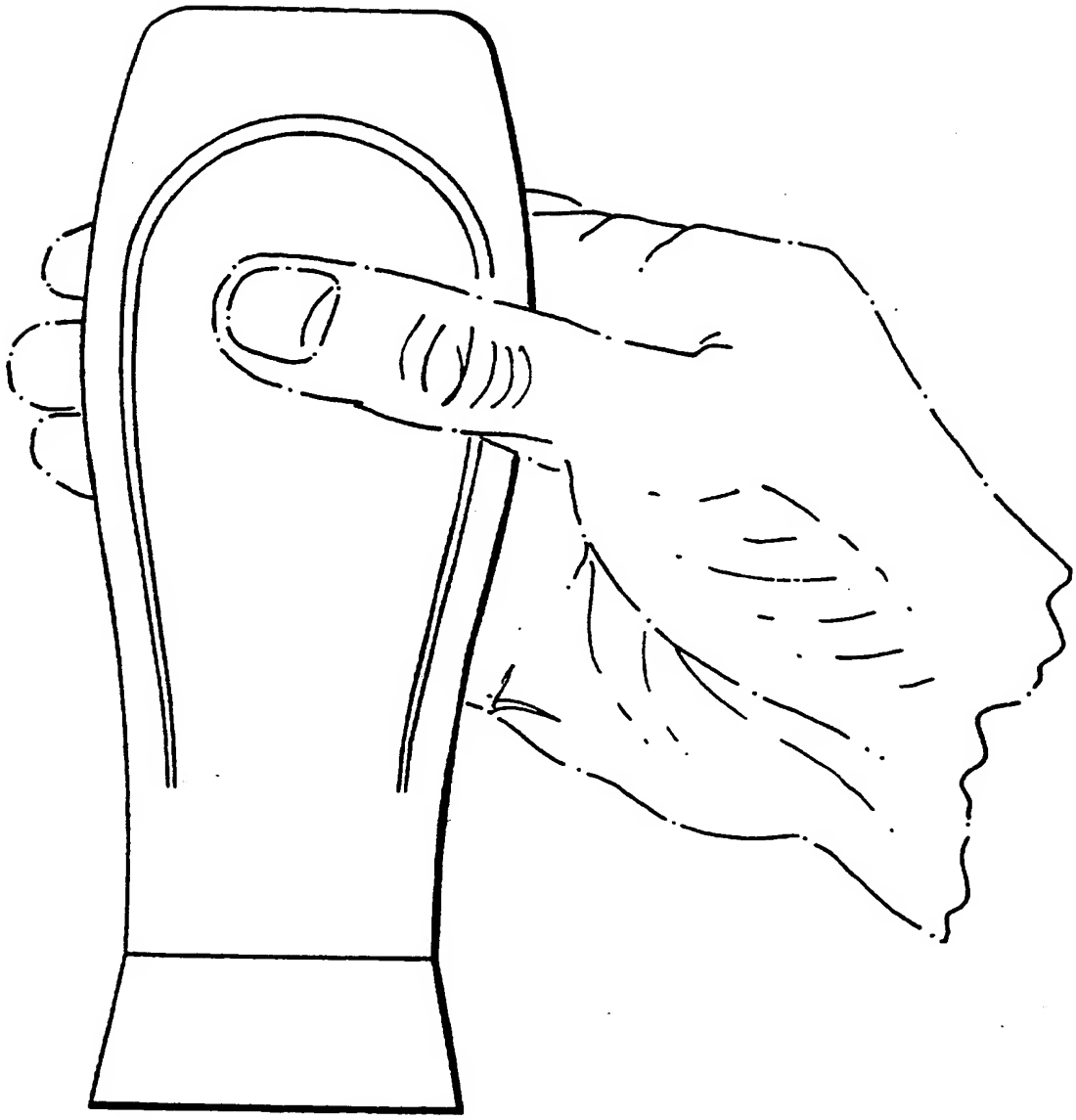


FIG. 14

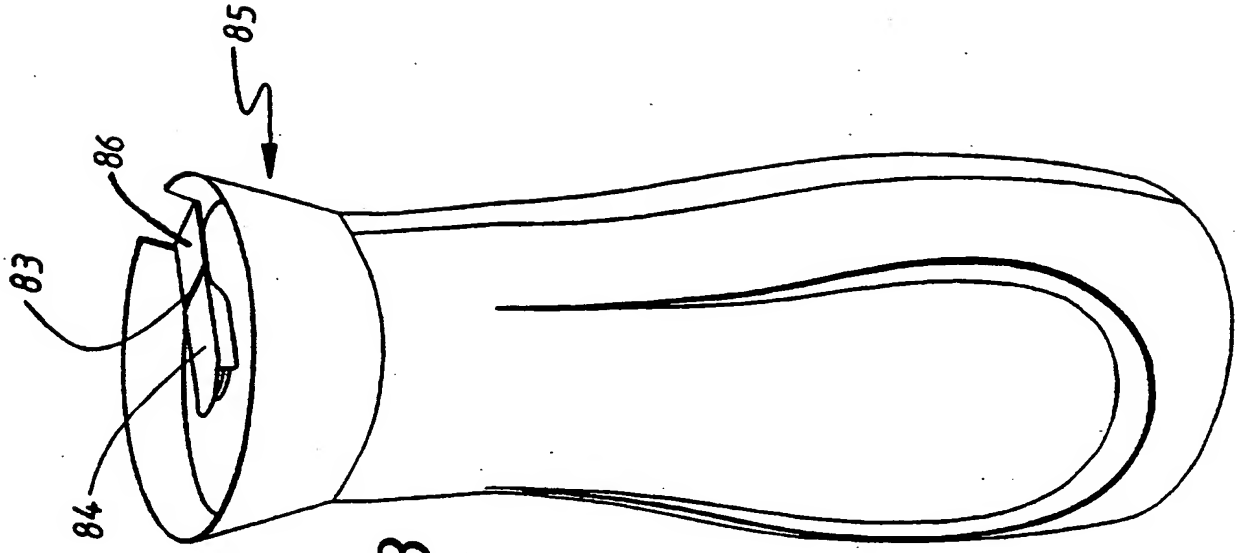


FIG. 15B

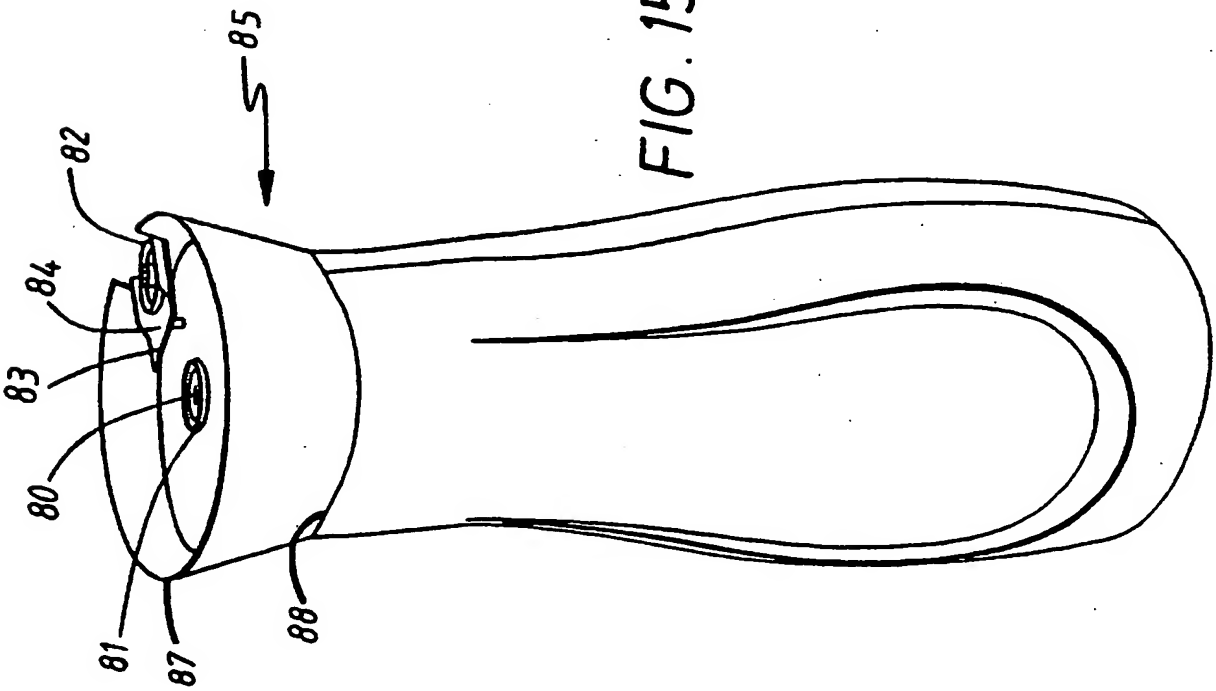


FIG. 15A

FIG. 16A

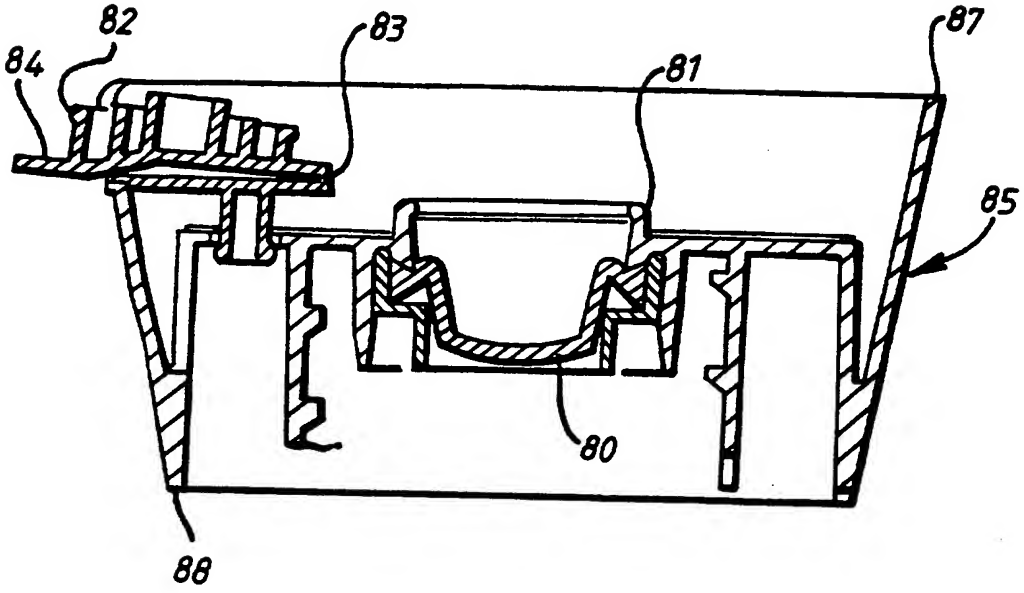
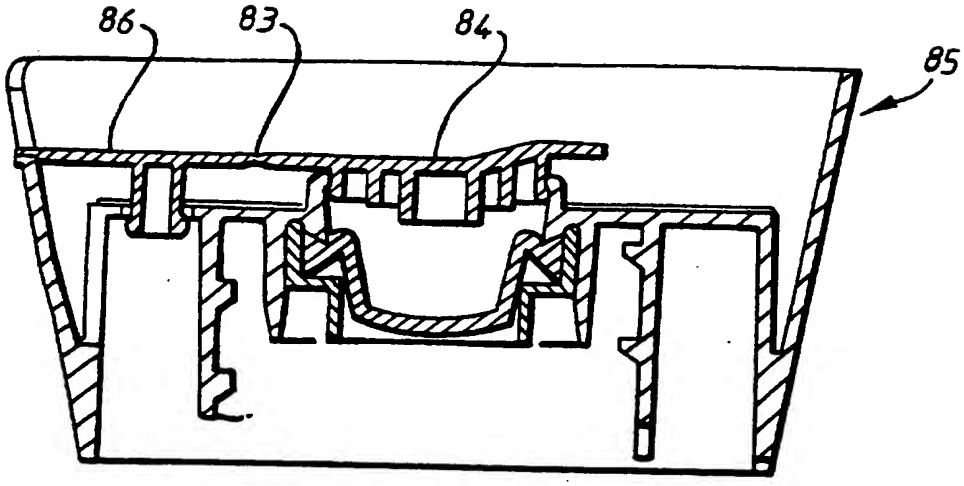


FIG. 16B



DISPENSING CONTAINER

Field of the Invention

This invention relates to the field of dispensing containers. More particularly, this invention relates to containers having an improved shape which are suitable for use for adults and children.

Background of the Invention

The vast majority of dispensing containers in use today are sized to be used by adults. Young children have much smaller hand sizes, and accordingly, it is difficult for them to handle and effectively dispense product from containers that were designed to be used by adults. Conversely, it would be difficult for an adult to use a dispensing container that was specifically designed for use by small children.

Another related problem with conventional containers is that they are designed for dispensing products by adults. i.e., the amount of force required to express product from the container is commensurate with the strength of the adult hand. Children and the elderly, being weaker than most adults, have less force available to dispense products. Therefore, it would be desirable for a container to have a low required dispensing force in order for the container to be preferred by those lacking great hand strength.

In conventional packaging for toiletries. products are often packaged for storage in an upright orientation, i.e.. in which the closed end of the container is oriented below it's open end. as when the container is

positioned when being filled with product to be contained therein. While such products are frequently stored in an upright configuration, product is often dispensed from the container in an inverted orientation. Containers typically have a certain hold-up, i.e., a volume of product that is not conveniently dispensed because of contact with the container walls. The amount of hold-up is accentuated in containers in which the product is stored in one orientation and used in the opposite orientation. This problem is further accentuated in the case of viscous products such as shampoo.

Another problem with conventional containers is that they may slip from the hands, particularly when the hands are wet. This is especially a problem for toiletry containers that are typically used in the bath by small children, such as shampoo and body wash products.

It is, accordingly, an object of the invention to provide a dispensing container that is designed to fit comfortably in the hands of both small children as well as adults.

It is yet another object of the present invention to provide a container that requires minimum force to dispense products therefrom so as to be preferred for use by those lacking great hand strength.

It is a further object of the invention to provide containers with design features that prevent the container from slipping from the users' hands, particularly when their hands are wet.

It is another object of the present invention to provide a container which is stable for storage in an inverted configuration so as to minimize the hold-up of the contents of the container, particularly when used for the storage of viscous liquid products.

It is yet another object of the invention to provide a container which is ergonomically effective for use by children and adults while containing surfaces which facilitate labeling of the container.

Summary of the Invention

In accordance with this invention, there is provided a dispensing container which comprises, consists of, and/or consists essentially of an open end, a closed end, and a body. The body has a front, a rear, a first side and a second side, an upper portion adjacent the open end, a lower portion adjacent the closed end and a central portion intermediate the upper and lower portions. The dispensing container of the invention further comprises a first recess on the front of the body and a second recess on the rear of the body, the recesses being adjacent the closed end and sides of the container. The first recess defines a first panel on the front of the container and the second recess defines a second panel on the rear of the container. The container further comprises a neck which defines an opening in the container, the neck having a finish suitable for accommodating a closure.

Another aspect of the invention relates to a dispensing container which comprises, consists of, and/or consists essentially of an open end, a closed end, and a body. The body has a front, a rear, a first side and a second side, an upper portion adjacent the open end, a lower portion adjacent the closed end and a central portion intermediate the upper and lower portions. The dispensing container of the invention further comprises a first recess on the front of the body and a second recess on the rear of the body, the recesses being adjacent the closed end and sides of the

container. The first recess defines a first panel on the front of the container and the second recess defines a second panel on the rear of the container. The container further comprises a neck which defines an opening in the container, the neck having a finish suitable for accommodating a closure. The container further comprises a closure.

Yet another aspect of the invention relates to a container adapted for the dispensing of liquids. The container, comprising a resilient polymeric material, further comprises, consists of, and/or consists essentially of:

a. an open end, a closed end, and a body, the body having a front, a rear, a first side and a second side, an upper portion adjacent the open end, a lower portion adjacent the closed end and a central portion intermediate the upper and lower portions;

b. a first recess on the front of the body and a second recess on the rear of the body, the recesses being adjacent the closed end and sides. The first recess defines a first panel on the front of the container and the second recess defines a second panel on the rear of the container;

c. a neck defining an opening in the container. The neck has a finish suitable for accommodating a closure;

d. a closure adapted for dispensing liquids; wherein:

    1. the upper body portion is substantially circular in cross-section and has a circumference of between about 4.7 and about 6.0 inches;

    2. the upper body portion has a length of at least about 0.2

inches;

3. the central body portion is substantially oval in cross-section and increases in circumference from the upper body portion to the lower body portion;

4. the lower body portion is substantially oval in cross-section and decreases in circumference from the central body portion to the closed end; and

5. the panels have a major dimension in the direction from the open end to the closed end of the container and a minor dimension from the first side to the second side of the container, the panels being curved in the minor dimension and substantially straight in the major direction.

The container of this invention possesses one or more beneficial characteristics. Not only is the container designed to fit comfortably in the hands of both children and adults, but it also requires only a minimum amount of force to dispense products therefrom. Further, the containers are of a design which prevents slippage from the hands of the user, which minimizes hold-up of the contents contained therein, and which contains surfaces that facilitate labeling.

Brief Description of the Drawings

The invention will be more fully understood and further advantages will become apparent when reference is made to the following detailed description of the invention and the accompanying drawings in which:

FIG. 1A is a front plan view of a preferred structure of the container of this

invention.

FIG. 1B is a side plan view of the container of FIG. 1A.

FIG. 1C is a front plan view of the container of FIG. 1A showing section lines A-A through F-F.

FIG. 2A through FIG. 2F are cross-sectional views of the container of FIG. 1C at section lines A-A through F-F, respectively.

FIG. 3A and FIG. 3B are front plan views of containers of this invention having finger gripping means.

FIG. 4 is an alternate embodiment of the container of FIG. 1A.

FIG. 5A, FIG. 5B and FIG. 5C are front, side and rear plan views, respectively, of the container of FIG. 1A fitted with a liquid dispensing closure.

FIG. 6A is a front plan view of the container of FIG. 1A fitted with an alternate liquid closure.

FIG. 6B is a front plan view of the container of FIG. 6A in an inverted orientation.

FIG. 7 is a front plan view of the container of FIG. 1A fitted with a closure containing an aerosol pump dispenser.

FIG. 8 is a front plan view of another example of the container of the invention with a neck finish adapted for dispensing powders.

FIG. 9 is the container of FIG. 8 fitted with a closure.

FIG. 10A is a top plan view of the neck finish of the container of FIG. 8.

FIG. 10B and FIG. 10C are top plan views of the closure of the container of FIG. 9 showing the closure in the open and closed position, respectively.

FIG. 11 is a graph of the force (lbs) required to discharge liquid from a valved container of this invention versus the volume (ml) of liquid discharged.

Fig. 12A and Fig. 12B are front and side views, respectively of a container used for packaging of commercially available childrens' toiletries.

Figure 13 shows a side view of the container of the invention in an inverted position supported by supports positioned in the recesses of the container but not in contact with the panels of the container.

Figure 14 shows a hand-held container of the invention held in position for dispensing product from the container.

Figure 15A shows another embodiment of the container of the invention with a closure container a valve and a lid in the open position.

Figure 15B shows the container of Figure 15B with the lid in the closed position.

Figure 16A and Figure 16B show the closure of the container of Figure 15A and Figure 15B in cross-section with the lid in the open and closed positions, respectively.

Detailed Description of the Preferred Embodiments

As used herein, the term "upright orientation" shall mean that the closed end of the container is below the open end of the container, as when the container is positioned when being filled with product to be contained

therein. Conversely, the term "inverted orientation" shall mean that the closed end of the container is positioned above the open end. Similarly, the term "sideways orientation" shall mean that the container is in an orientation that is intermediate the upright and inverted orientations. This orientation description is merely used for convenience in describing the orientation of the container and is not meant to imply the orientation of the container during storage and dispensing of products therefrom. As will be described subsequently, various embodiments of the containers of the invention may be used in either an upright or an inverted orientation.

The basic form of the invention is shown by the container in an upright orientation in FIGS. 1A, 1B and 1C, which is generally designated 6. The container 6 contains an open end 1 and a closed end 2. The closed end 2 of the container 6 preferably has a surface 21 that permits the container 6 to remain standing when placed on a flat surface in an upright orientation. The open end 1 of the container 6 contains a neck 3 which defines an opening 20 in the container. The neck contains a neck finish 4 adapted to mate with a closure (not shown) for the container. The neck finish shown in FIGS. 1A and 1B is a threaded finish, although any of the other finishes known in the art may be used with the containers of the invention. By way of example, other suitable finishes include, but are not limited to, a press-fit finish, a snap-on finish, a snap and turn finish or an oriented thread finish as disclosed in, for example, The Wiley Encyclopedia of Packaging Technology, John Wiley and Sons, New York, 1986.

The open end 1 of the container 6 further comprises a shoulder 5 which connects the neck 3 to the body 22 of the container. The body 22 of

the container contains an upper body portion 7 adjacent the open end 1 which is preferably cylindrical in cross-section. The upper body portion 7 of the container 6 preferably has a circumference, as measured normal to the longitudinal axis 23 of the container 6, which may range from about 4.7 inches, to about 6.0 inches, more preferably from about 5.0 inches to about 5.7 inches, and most preferably, from about 5.2 inches to about 5.7 inches. The upper body portion 7 preferably has a substantially constant circumference for a length down the longitudinal axis of the container 6 of at least about 0.2 inches.

As illustrated in FIG. 1A, the upper body portion 7 transitions to a central body portion 8, which is located below and proximate to the upper body portion 7 along the longitudinal axis 23. In transitioning from the upper body portion 7 to the central body portion 8, the container 6 continually increases in circumference and begins to assume more of a generally oval or elliptical cross-sectional shape. Proceeding down the longitudinal axis of the container 6, the circumference of the container continues to increase until the region of maximum circumference 9, after which preferably the circumference of the container 6 continually decreases. The region of maximum circumference marks the transition from the central body portion 8 to the lower body portion 10 of the container 6 adjacent its closed end 2.

While the longitudinal length of the upper body portion 7, the central body portion 8, and the lower body portion 10 may vary depending upon the desired use of the container 6, the ratio of the lengths of the central body portion to the upper body portion preferably ranges from about 1.2 : 1 to about 6 :1, and more preferably ranges from about 1.75 : 1 to about 5 : 1.

The ratio of the lower body portion to the upper body portion preferably ranges from about 1 : 1 to about 3 : 1, and more preferably, from about 1.2 : 1 to about 2.5 : 1.

The variation of the cross-sectional shape and circumference of the container 6 along its longitudinal length is depicted in FIGS. 2A through 2F. Each of these Figures depicts the approximate cross-sectional shapes of the container 6 along section lines A-A through F-F, respectively, illustrated in FIG. 1C. We have unexpectedly found that the variation in circumference of the container along the longitudinal axis of the upper body portion 7 permits the same container that is ergonomically advantageous for use by small children to be comfortably held and used by larger children and adults.

As shown in FIGS. 1A and 1B, the body portion 22 of the container 6 comprises a front 11, a rear 12, a first side 13 and a second side 14. The front 11 of the container contains a first recess 15 and the rear of the container contains a second recess 16. The recesses are adjacent the closed end 2, the first side 13 and the second side 14 of the container 6. The first recess 15 and the second recess 16 define a first panel 17 and a second panel 18 on the front and rear of the container, respectively. Each of the recesses has a depth 19, as shown in FIG. 1B. The depth of the recess 15, for example, is the distance, perpendicular to the longitudinal axis, from a projection line 21 projected from the closed end 2 of the container 6 to the panel 17 of the container. As shown in FIG. 13, the recesses have a depth sufficient to permit the container 6 to be held by a first support 71 positioned tangentially in the recess 15 on the front 11 of the

container 6 and a second support 72 positioned in the recess 16 on the rear 12 of the container 6 when the container is in an inverted orientation; the supports do not actually contact the panels of the container. We have surprisingly found that the depth of these recesses is effective in providing an anti-slip feature to the container when the container is being handled in either an inverted or sideways orientation, particularly when the container is wet, as it might be when used to contain and dispense cleansing toiletries such as body cleansers and shampoos that are used in the shower or in the bath.

The depth of the recess may be of any thickness desired and may depend on, for example, the desired end use of the container and the contents stored therein. The depth of the recess is preferably varied at different locations on the container, and more preferably is at its deepest proximate to the closed end 2 of the container and gradually reduces in the longitudinal direction towards the open end 2 and proximate to the first side 13 and the second side 14. Preferably the depth of the recesses ranges from about 2.0 mm to about 3.4 mm, and more preferably from about 2.5 mm to about 2.9 mm. While such depths are preferred as providing a container having effective anti-slip properties, it is to be understood that other recess depths may be produced to satisfy a particular need and yet fall within the scope of the present invention.

In a preferred embodiment, the recesses are not adjacent the open end of the container and thus render a "U - shaped" exterior frame to the panels. Absence of a recess near the open end 1 permits users of the container to freely slide their hands over substantially the entire length of

the first and second panels from the bottom of the panels nearest the closed end 2 of the container to the open end 1 of the container to seek out that portion of the container which has a circumference most commensurate with the user's hand size.

The dimensions and structural features of the containers of the invention enumerated above are believed to permit the containers of the invention to be easily gripped and handled by both adults and young children in an ergonomically preferable manner. As will be discussed subsequently, these dimensions and features are believed to account for the perceived preference of consumers in terms of handleability of the containers of the invention relative to prior art containers.

As illustrated in FIGS. 1A and 1B, the panels 17 and 18 are recessed relative to the sides 13, 14, and closed end 2 of the container. Although the size, shape and geometry of the panels may vary depending upon the desired end use of the container, it is preferably that the first panel 17 and second panel 18 are identical in size, shape and geometry. The panels have a major dimension in the direction from the open end 1 to the closed end 2 of the container, i.e., in a direction generally parallel to the longitudinal axis 23 of the container, and a minor dimension in the direction from the first side to the second side of the container, i.e., generally normal to the longitudinal axis 23. The length of the panel is defined as the distance from that point of the recess 15 closest to the bottom of the container 24, i.e., point 30, to the top 29 of the upper body portion 7 of the container.

The panels 17, 18 have surfaces 27 and 28 that may either be

substantially flat or curved. If the panel surfaces are curved, it is preferred that the curve extends in only a single dimension and is substantially straight in the other dimension. For example, the container of the invention depicted in FIGS. 1A and 1B have panels 17, 18 that are curved in their minor dimension but are substantially straight in their major dimension. More preferably, the panels are substantially straight in their major dimension for a distance, based upon the longitudinal length of the panel, of at least about 50 percent of their longitudinal length, and even more preferably for a distance of at least about 65 percent of their longitudinal length. We have found that this panel geometry is especially favorable to permit labeling or decorating the container in its panel sections by either printing or by adhering of an adhesive-backed label to the container. In the case of printing, absence of curvature in two dimensions over a substantial portion of the panel permits firm contact of a print roll to that portion of the panel. Likewise, in the case of adhesive labeling, absence of curvature in two dimensions over a substantial portion of the panel permits adhering an adhesive label to the panel without wrinkling the label.

FIGS. 3A and 3B show alternate embodiments of the containers of the invention in which the containers have optional raised lateral protrusions 25 or depressions 26 in their sides in order to provide means for enhancing the grip of a user's fingers around the container. Alternatively, the containers of the invention may contain a combination of both protrusions and depressions. Although FIGS. 3A and 3B illustrate only lateral, protrusions and circular depressions, one skilled in the art will appreciate that the container of the present invention may possess protrusions, depressions, and or other grip-enhancing means such as rubber or

polymeric sections molded or adhered to the container, of any shape, size and amount in order to enhance the user's grip of the container.

FIG. 4 shows an alternate embodiment of the container of FIGS. 1A and 1B, wherein the contained volume of the container of FIG. 4 is about one half of the contained volume of the container of FIGS. 1A and 1B.

In another embodiment of the present invention, the container 6 of the present invention is fitted with a closure 39 to contain and dispense the products contained therein. One skilled in the art would readily appreciate that the type of closure suitable for use in the present invention would depend upon various factors, such as the form of the product in the container, the desired form in which the product is to be dispensed, and the degree of convenience to be provided to the consumer.

Any of the closures known in the art may be used with the containers of the present invention. including but not limited to those disclosed in The Wiley Encyclopedia of Packaging Technology, John Wiley and Sons, New York, 1986.

In the case of containers used for the storage and dispensing of liquids, the simplest form of closure would be a conventional cap of one piece construction which must be removed from the container in order to dispense product therefrom; however, the use of a closure which need not be removed from the container in order to dispense product therefrom is preferred.

An example of a container 6 fitted with a closure 39 for dispensing liquid products is illustrated in FIGS. 5A, 5B and 5C, which depicts the container of FIGS. 1A and 1B fitted with a commercial hinged closure.

Other suitable closures include those well-known in the art including, but not limited to: 1) those containing a lid and body in which the lid is completely removable from the body of the closure; 2) those having a lid that is slidably connected to the body of the closure: 3) those not having a lid such as the push-pull type and the flip-spout type of closures, as disclosed in, for example The Wiley Encyclopedia of Packaging Technology, John Wiley and Sons, New York, 1986.

Closure 39 comprises a body portion 31 and a lid portion 32 hingedly connected to the body portion via hinge 33. Body portion 31 contains an orifice (not shown) through which product may be dispensed. Lid portion 32 contains a pin on its underside (not shown) which is sized to fit tightly into the orifice of body portion 31. When the lid portion 32 is in its closed position, the pin contacts the body portion 31 so as to seal the container and thus prevent dispensing of its contents. Body portion 31 may contain an optional recess 34 in order to permit easy opening of the closure by positioning a finger in the recess 34 under a portion of the lid 35 and subsequently applying force to the underside of the lid.

Closure 39 has a base 36 adjacent the upper body portion of the container and a top 37 remote from the base 36. Closure 39 has a substantially uniform circular circumference from its base 36 to its top 37 which is substantially equal to the circumference of the upper body portion of the container.

Another novel feature of the present invention is illustrated in FIGS. 5A - 5C. Closure 39 preferably has a top surface 38 which permits storage of the container in an inverted orientation. As the contents of the container

are depleted, storage of the container in the inverted orientation permits the remaining contents of the container to collect at the container's open end rather then at its closed end, thereby permitting the dispensing of substantially the entire contents of the container and virtually eliminating the problem of "hold up" for more viscous contents. Preferably, both the closed end of the container and the top end of the closure have surfaces that permit the container to be stored in either an upright or inverted orientation.

Another embodiment of the container of the present invention is shown in an upright and inverted orientation in FIGS. 6A and 6B, respectively. The closure 40 has a base 41 adjacent the upper body portion of the container and a top 42 remote from the base 41. The base 41 has a substantially circular circumference which is substantially equal to the circumference of the upper body portion 7 of the container. The closure 40 is tapered such that the circumference of the closure increases from the base 41 to the top 42 of the closure. The degree of taper may vary depending upon the desired end use of the container and the desired aesthetic effect. The closure 40 has a top surface 43 which permits the storage of the container in an inverted orientation. The larger circumference at the top of the tapered closure confers added stability to the container when it is stored in an inverted orientation.

In another preferred embodiment, the closure used in the containers of the invention may contain a valve as illustrated in FIGS. 15A. Illustrative examples of suitable valves for use in the containers of the invention include. but are not limited to those disclosed in U.S. 5,439,143, U.S. 4,749.108 and U.S. 4.846.810. all of which are incorporated herein in their

entirety by reference. Such valves are generally designed to open at pressures exceeding a certain threshold pressure, thereby allowing product to be released from the container, and to close at pressures below the threshold pressure, thereby restraining the release of product from the container. The minimum value of the threshold pressure of the valve is dictated by the need for the valve to contain the contents of the container when the container contents exhibit the maximum head pressure, i.e., when the container is full. The head pressure of the container contents, in turn, depends on the density of the contents and the geometry of the container. In practice, the practical minimum threshold pressure is somewhat higher than the head pressure in order to accommodate slight pressure changes that may occur in the container as it is handled when discharge of the contents is not desired. The maximum value of the threshold pressure is dictated by the need to have the valve open when the container is squeezed by its intended users. In the containers of the invention, the valves must be activatable not only by adults, but also, by children and/or the elderly who have relatively weaker hand strength.

With containers made of resilient materials, the application of a squeezing force to the outside of the container provides a pressure inside the container that exceeds the threshold pressure, thereby permitting product to be released from the container. Discontinuing or sufficiently reducing the squeezing force reduces the pressure inside the container to below the threshold pressure, thereby restraining the release of product from the container. This feature is particularly important for applications in which the container will be frequently used in the inverted orientation.

Figure 15A and Figure 15B show a container of the invention with a closure 85 that contains a lid 84 and a valve 80. The lid 84 is hingedly connected to extension member 86 via hinge 83. Lid 84 contains a stopper 82 on its underside that mates with protruding orifice ring 81 of the closure 85. When in use and in a position ready to dispense product, lid 84 is in the retracted position as shown in Figure 15A. In storage and during shipment, lid 84 is in the closed position as shown in Figure 15B. When in the closed position, stopper 82 on the underside of lid 84 is mated with protruding orifice ring 81, thereby preventing inversion of valve 80 and release of product therefrom. Closure 85 has a circumference at its bottom 88 adjacent the upper body portion of the container that is substantially equal to the circumference of the upper body portion of the container. Closure 85 is tapered, the circumference at its top 87 being larger that at its bottom 88. The larger circumference at the top 87 of the closure 85 provides added stability to the container in storage in the inverted orientation.

Valves may be incorporated into the closures via methods known in the art including but not limited to retaining the valve in the closure by mechanical means, as, for example, by the use of a retaining ring that snaps in place against the body of the closure. Such a closure is described in U.S. 5,377,877 which is incorporated herein in its entirety by reference. Alternatively, the valve and closure may be integrally formed, as, for example, by multi-injection or co-injection molding of disparate materials comprising the closure and the valve. Methods for co-injection molding are described, for example, in U.S. 5,523,045 and in the Modern Plastics Encyclopedia. McGraw-Hill, New York, 1990, which are incorporated herein in their entirety by reference.

FIG. 6B illustrates the container of FIG. 6A in an inverted orientation. It will be noted that the container exhibits a generally "exclamation-point" shape in the inverted orientation. The container dimensions are such that small children can conveniently and comfortably grip the container near its upper body portion 7, while larger children and adults may comfortably grip the container at its central body portion 8 or at its lower body portion 10. The container 6 is preferably of a size and shape to permit an adult with average-sized hands to grasp the container at its widest point 9 by holding the rear of the container in the palm of the hand such that the thumb and fingers can contact the sides of the container and at least partially contact the front of the container.

In an alternative embodiment, the containers of the present invention may contain a closure adapted to dispense liquids in the form of sprays or aerosols. An example of an aerosol dispensing container of the invention is shown in FIG. 7, in which the container of FIGS. 1A and 1B is fitted with a commercial closure 50 containing an aerosol pump. The closure has a knurled collar 51 which facilitates attachment to the container and grasping of the container at least in part at the knurled collar. Product contained therein is dispensed from the container out of orifice 53 by depressing pump plunger 52.

Other spray means known in the art that may be used with the containers of the invention include, but are not limited to, a squeeze spray which would be activated by squeezing the container, or an atomizer spray bulb, as disclosed in The Wiley Encyclopedia of Packaging Technology, John Wiley and Sons, New York, 1986.

In an alternative embodiment, products such as liquid surfactant products may be dispensed from containers 6 as foams by the suitable entrainment of air in the liquid as it is dispensed. For example, U.S. 5,271,530, U.S. 5,570,819, U.S. 4,022,351. U.S. 5,037,006, U.S. 5,364,031 and U.S. 5,462,208 describe foam dispensing nozzles and pumps, these patents being incorporated herein in their entirety by reference. The foam is typically expelled from containers containing such nozzles and pumps by either squeezing the container or by activating a pump.

Another embodiment is directed to a container having a neck finish adapted to the dispensing of powdered solids such as talcum powder as illustrated in FIGS. 8, 9, 10A, 10B, and 10C. The neck finish 60 of the container contains grooves 61 that communicate with the void volume of the container, and flat surfaces 62. Closure 63 mates with the neck finish 60 in a snap-fit fashion. The closure, 63 contains one or more holes 64 preferably in a pattern that coincides with the pattern of channels 61 in the neck finish 60. The closure is free to rotate at least a portion of a revolution when in mated contact with the neck finish. The open position, which permits the powder to be dispensed from the container, is illustrated in FIG. 10B, wherein the holes 64 in closure 63 are aligned with the channels 61 in neck finish 60. Similarly, FIG. 10C shows the closed position of the closure whereby the closure is rotated 30 degrees from its position shown in FIG. 10B.

The containers of the invention may be comprised of any material that may be formed into the shape desired and which is inert to the materials contained therein. Preferred materials include any resilient

polymeric material commonly used in the container-making art including, but not limited to, polyethylene, polypropylene, polyvinyl chloride based resins, polyethylene terephthalate, or copolymers or mixtures thereof. "Copolymers," as used herein shall mean any polymer having two or more monomer components.

Various grades of polyethylene, including low density polyethylene, medium density polyethylene, high density polyethylene or copolymers or mixtures or blends thereof are frequently compatible with toiletry products, and are preferred materials for the containers of the invention. Low density polyethylene yields a bottle that is relatively easy to squeeze, while high density polyethylene bottles are relatively stiff. In the case of liquid products that are dispensed by squeezing the container, a 50:50 blend of low density and high density polyethylene is preferred. In the case of powders, where the desired dispensing mode is by shaking the container, a stiffer container produced from high density polyethylene is preferred.

The thickness of the exterior walls, i.e. panels, first side, second side, and the like, may be of any thickness desired, may vary within a container, and may depend on the desired end use of the container and the contents stored therein. Preferably the thickness of the walls ranges from about 10 mils to about 50 mils, and preferably from about 30 mils to about 40 mils. While such thicknesses are preferred as providing a readily resilient container, it is to be understood that other wall thicknesses may be produced to satisfy a particular need and yet fall within the scope of the present invention.

The containers of the present invention can be formed by any

conventional technique known in the art for producing containers including, but not limited to, extrusion blow molding, injection blow molding, stretch blow molding, and the like. Details of such processes are disclosed in, for example, The Wiley Encyclopedia of Packaging Technology, John Wiley and Sons, New York, 1986. Extrusion blow molding is the process of choice.

One noteworthy characteristic of the container of the present invention is that it fits comfortably in the hands of both adults and small children. Another noteworthy characteristic is that the containers of the present invention dispense product using relatively low hand force, and are therefore preferred by small children and adults lacking in hand strength. Yet another noteworthy characteristic is that the containers of the invention incorporate design features that prevent the container from slipping for the users' hands, particularly when the hands are wet. Yet another noteworthy feature of the containers of the invention is that they possess surfaces that are readily available for printing or labeling.

The invention illustratively disclosed herein suitably may be practiced in the absence of any component, ingredient, or step which is not specifically disclosed herein. Several examples are set forth below to further illustrate the nature of the invention and the manner of carrying it out. However, the invention should not be considered as being limited to the details thereof.

Examples

Test Methods Used in the Examples:

1) Dispensing Force Test: The force required for dispensing the contents from a container or "dispensing force" was measured using a

Uniforce Experimenters Kit (parallel port input/output version) manufactured by Force Imaging Technologies, having thin (0.003mm), flexible sensor strips that may be mounted on a variety of surfaces with little or no effect on the test sample, and both software (Uniform Sensor System version 5) and hardware that interfaces the sensor to a personal computer for data acquisition.

A sensor strip with the proper force range (usually 0-10lbs) is mounted on one of the panels of the sample container with the sensor mounted at the location where a user's thumb would typically contact the container during normal dispensing of product from the container as shown in FIG. 14. For an adult-sized hand, the thumb normally contacts the panel at a point between about 70 percent to about 80 percent of the length of the panel, closest to the closed end 2 of the container. The software is set in the record data mode with a time duration of between 1.25 – 1.75 sec. The container is held in a user's hand with the thumb on one face of the container and the other fingers on the opposite face of the container. With the thumb on the sensor, the container is held in a vertical position with the dispensing orifice directed downward over a beaker positioned on a model PE 600 Metler electronic balance. The containers are then manually squeezed with enough force to open the valve and dispense a standard quantity of product (3-6 g) contained therein. The maximum force that is required to open the valve and to dispense each quantity of product is output by the computer program. That force value, along with the weight of product dispensed, is tabulated manually by the operator.

After resetting the balance to zero, the above sequence is repeated

until the container is empty of all product. The data collected by the operator is then used to generate a graph showing the force required to open the valve as a function of the cumulative amount of product dispensed from the container.

Example 1: Dispensing Force Measurement:

The force required for dispensing product from containers of the present invention, as well as for various commercially available containers shown in Table 1 below, was measured in accordance with the Dispensing Force Test described above. Each of the containers in Table 1 was fitted with a closure containing a silicone dispensing valve available from Seaquist Closures, Mukwonago, Wisconsin.

Table 1. Types of Containers

Legend Number	Product	Container Size (mL)	Product Source
1	Lever 2000 Body Wash	354	Lever Bros.
2	Vaseline Intensive Care Moisturizing Body Wash	177	Cheeseborough-Ponds
3	Baby Magic Moisturizing Baby Bath	200	Mennen
4	Soft Soap Gentle Antibacterial Body Wash	354	Colgate-Palmolive
5	Container of the invention as shown in FIG. 4	100	
6	container of the invention as shown in FIG. 1 and FIG. 6A, 6B	200	

To remove any inconsistencies arising from dispensing products of different viscosities, water was substituted for the as-packaged and purchased contents of all containers. The results of these force measurements are shown in FIG. 11.

It is evident from FIG. 11 that the containers of the present invention require the lowest amount of force to dispense product relative to the other containers tested. Accordingly, the containers of the invention are expected to be easiest to dispense product by those having weak hand strength such as small children and elderly adults.

Consumer Research Tests

In-home consumer research tests were conducted of the containers of the invention shown in Figures 5A, 5B and 5C. Consumers were asked to compare the container of the invention to a prior art container shown in Figures 12A and 12B which is currently used commercially as a container for childrens' toiletries. Containers were evaluated in 100 households by mothers and by children aged 6 to 10. The containers were rated for ease of handling by asking the participants to rate the container in the following categories:

1. very easy for child to handle
2. easy for child to handle
3. neither easy nor difficult to handle
4. difficult for child to handle
5. very difficult for child to handle

The results of this "handleability" measure are shown in Table 2 below:

Table 2. Handleability of Containers

	percentage who found the container to be very easy to handle or easy to handle	
	prior art container (Figures 12A and 12B)	Container of the invention (Figures 5A, 5B, 5C)
Mothers	84	94
Children	82	93

Thus, the data of Table 2 indicate that both mothers and children found the container of the invention to be significantly easier to handle than the prior art container of Figures 12A and 12B. The dimensions and structural features of the containers of the invention enumerated above are believed to permit the containers of the invention to be easily gripped and handled by both adults and young children in an ergonomically preferable manner. These dimensions and features are believed to account for the perceived preference of consumers in terms of handleability of the containers of the invention relative to prior art containers.

Uniqueness of the Containers of the Invention

Children were asked to assess the uniqueness of the design of the container of the invention in comparison to the prior art container of Figures 12A and 12B. The subjects were asked to rate the containers as follows:

1. Extremely new and different
2. Very new and different
3. Somewhat new and different
4. Slightly new and different
5. Not at all new and different

The results of this "uniqueness" measure are shown below:

Table 3. Uniqueness of Containers

	percentage of children who found the container to be extremely new and different or very new and different	
	prior art container (Figures 12A and 12B)	Container of the invention (Figures 5A, 5B, 5C)
Children	39	55

Thus, children found the containers of the invention to be significantly more unique than prior art containers.

In the foregoing description, it will be readily apparent that modifications may be made to the invention without departing from the concepts disclosed herein. Such modifications are to be considered as included in the following claims, unless these claims by their language expressly state otherwise.

We claim:

1. A dispensing container comprising:

   a. an open end, a closed end. and a body, said body having a front, a rear, a first side and a second side, an upper portion adjacent said open end, a lower portion adjacent said closed end and a central portion intermediate said upper and lower portions;

   b. a first recess on said front of said body and a second recess on said rear of said body, said recesses being adjacent said closed end and said sides, said first recess defining a first panel on the front of said container and said second recess defining a second panel on the rear of said container; and

   c. a neck defining an opening in said container, said neck having a finish suitable for accommodating a closure.

2. The container of claim 1 wherein the container comprises a resilient polymeric material.

3. The container of claim 2 wherein the resilient polymeric material comprises low density polyethylene, medium density polyethylene, high density polyethylene or mixtures thereof.

4. The container of claim 1 wherein the upper body portion is substantially circular in cross-section and has a circumference between about 4.7 and about 6.0 inches.

5. The container of claim 1 wherein the upper body portion is substantially circular in cross-section and has a circumference between about 5.0 to about 5.7 inches.

6. The container of claim 1 wherein the upper body portion is substantially circular in cross-section and has a circumference between about 5.2 and about 5.5 inches.

7. The container of claim 4 wherein said upper body portion has a length of at least about 0.2 inches.

8. The container of claim 1 wherein said central body portion is substantially oval in cross-section and increases in circumference from said upper body portion to said lower body portion.

9. The container of claim 1 wherein said lower body portion is substantially oval in cross-section and decreases in circumference from said central body portion to said closed end.

10. The container of claim 1 wherein said closed end has a surface which permits the container to remain standing in an upright orientation.

11. The container of claim 1 wherein said recess has a depth sufficient to permit the container to be held in an inverted position by a first support and a second support. whereby said first support is positioned in the recess on the front of the container and said second support is positioned in the recess on the rear of said container and the first support and the second support do not contact the panels of said container.

12. The container of claim 1 wherein said panels have a major dimension in the direction from the open end to the closed end of the container and a minor dimension from the first side to the second side of the container, said panels being curved in the minor dimension and substantially straight in the major direction.

13. The container of claim 1 wherein the finish is selected from a threaded finish, a press-fit finish, a snap-on finish, a snap and turn finish or an oriented thread finish.

14. The container of claim 1 which has a generally exclamation-point shape when in an inverted orientation.

15. The container of claim 1 which further comprises finger grip means.

16. A dispensing container comprising:

a. an open end, a closed end, and a body, said body having a front, a rear, a first side and a second side, an upper portion adjacent said open end, a lower portion adjacent said closed end and a central portion intermediate said upper and lower portions;

b. a first recess on said front of said body and a second recess on said rear of said body, said recesses being adjacent said closed end and said sides, said first recess defining a first panel on the front of said container and said second recess defining a second panel on the rear of said container;

c. a neck defining an opening in said container, said neck having a finish suitable for accommodating a closure; and

d. a closure.

17. The container of claim 16 wherein the container comprises a resilient polymeric material.

18. The container of claim 17 wherein the resilient polymeric material comprises low density polyethylene, medium density polyethylene, high

density polyethylene or mixtures thereof.

19. The container of claim 16 wherein the upper body portion is substantially circular in cross-section and has a circumference between about 4.7 and about 6.0 inches.

20. The container of claim 16 wherein the upper body portion is substantially circular in cross-section and has a circumference between about 5.0 to about 5.7 inches.

21. The container of claim 16 wherein the upper body portion is substantially circular in cross-section and has a circumference between about 5.2 and about 5.5 inches.

22. The container of claim 19 wherein said upper body portion has a length of at least about 0.2 inches.

23. The container of claim 16 wherein said central body portion is substantially oval in cross-section and increases in circumference from said upper body portion to said lower body portion.

24. The container of claim 16 wherein said lower body portion is substantially oval in cross-section and decreases in circumference from said central body portion to said closed end.

25. The container of claim 16 wherein said closed end has a surface which permits the container to remain standing in an upright orientation.

26. The container of claim 16 wherein said recess has a depth sufficient to permit the container to be held in an inverted position by a first support and a second support. whereby said first support is positioned in the recess on the front of the container and said second support is positioned in the

recess on the rear of said container and the first support and the second support do not contact the panels of said container.

27. The container of claim 16 wherein said panels have a major dimension in the direction from the open end to the closed end of the container and a minor dimension from the first side to the second side of the container, said panels being curved in the minor dimension and substantially straight in the major direction.

28. The container of claim 16 wherein the finish is selected from a threaded finish, a press-fit finish, a snap-on finish, a snap and turn finish or an oriented thread finish.

29. The container of claim 16 which further comprises finger grip means.

30. The container of claim 16 wherein said container is adapted for dispensing liquids.

31. The container of claim 16 wherein said container is adapted for dispensing solids.

32. The container of claim 16 wherein said container is adapted for dispensing liquids in the form of an aerosol.

33. The container of claim 30 wherein said closure comprises a body portion and a lid portion, said body portion of said closure having an orifice for dispensing liquids and said lid portion of said closure having sealing means for sealing said orifice.

34. The container of claim 33 wherein said lid portion of said closure is hingedly connected to said body portion of said closure.

35. The container of claim 30 wherein said closure comprises a valve, said valve having a threshold pressure below which liquid is not dispensed from said container.

36. The container of claim 30 wherein said closure has a surface which permits the container to remain standing when the container is in an inverted orientation.

37. The container of claim 30 wherein said closed end and said closure have surfaces which permit the container to remain standing in either an upright or inverted orientation.

38. The container of claim 30 wherein said closure has a substantially uniform circular circumference, said closure circumference being substantially equal to the circumference of the upper portion of the body of said container.

39. The container of claim 30 wherein said closure has a base and a top, said base of said closure being adjacent said upper portion of said body of said container, said closure having a substantially circular circumference at said base of said closure which is substantially equal to the circumference of said upper portion of the body of said container, said circumference of said closure increasing in size from the base of the closure to the top of the closure.

40. The container of claim 16 which has a generally exclamation-point shape when in an inverted orientation.

41. The container of claim 16 wherein said container is adapted for dispensing liquids in the form of a foam.

42. The container of claim 32 wherein the closure comprises a dispensing pump.

43. A container adapted for the dispensing of liquids, said container comprising a resilient polymeric material, said container further comprising:

a. an open end, a closed end, and a body, said body having a front, a rear, a first side and a second side, an upper portion adjacent said open end, a lower portion adjacent said closed end and a central portion intermediate said upper and lower portions;

b. a first recess on said front of said body and a second recess on said rear of said body, said recesses being adjacent said closed end and said sides, said first recess defining a first panel on the front of said container and said second recess defining a second panel on the rear of said container;

c. a neck defining an opening in said container, said neck having a finish suitable for accommodating a closure;

d. a closure adapted for dispensing liquids; wherein:

1. the upper body portion is substantially circular in cross-section and has a circumference of between about 4.7 and about 6.0 inches;

2. said upper body portion has a length of at least about 0.2 inches;

3. said central body portion is substantially oval in cross-section and increases in circumference from said upper body portion to said lower body portion;

4. said lower body portion is substantially oval in cross-section and decreases in circumference from said central body portion to said closed end; and

5. said panels have a major dimension in the direction from the open end to the closed end of the container and a minor dimension from the first side to the second side of the container, said panels being curved in the minor dimension and substantially straight in the major direction

44. A container substantially as hereinbefore described with reference to the accompanying drawings.

The Patent Office

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Application No: GB 9804824.2 **Examiner:** Gareth Prothero
Claims searched: 1-44 **Date of search:** 30 November 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
Y	GB 2288587 A	(GET A GRIP) see fig 1, and abstract.	15, 29
X Y	US 4949861 A	(COCHRAN) see figs 1, 4 and 5, and col 1, lines 36 to 41.	X: 1-8, 10-14, 16-23, 25-28, 30-43 Y: 15, 29
X Y	US 4946053 A	(CONRAD) see abstract, and figs 1 and 2.	X: 1-14, 16-28, 30-43 Y: 15, 29
X Y	US 4318882 A	(PURUSHOTTAM) see figs 6 and 7, and col 11, lines 11 to 21.	X: 1-7, 10-14, 16-22, 25-28, 30-43 Y: 15, 29

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.